AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS:

1-32(cancelled)

33(new). Analytical apparatus comprising: a piezoelectric sensor, and an oscillator circuit coupled to the piezoelectric sensor and adapted to provide an output signal at an output, wherein the output signal oscillates at the same frequency as the oscillator circuit, said frequency being substantially determined by the piezoelectric sensor, and wherein the oscillator circuit incorporates circuitry to maintain a substantially constant drive signal to the piezoelectric sensor, said circuitry including an amplifier with feedback coupling the output to an input of the amplifier to form a feedback loop through the amplifier, the feedback loop incorporating an automatic gain control, wherein the current through the piezoelectric sensor is mirrored in the oscillator circuit to provide a control signal to the automatic gain control.

34(new). Apparatus as claimed in claim 33 wherein the oscillator circuit is configured to operate in a linear mode.

35(new). Analytical apparatus according to claim 33, in which the oscillator includes a driver amplifier having a first output, connected to the input of said amplifier of the

circuitry for maintaining a substantially constant drive signal, and a second output, connected to the piezoelectric sensor, wherein the signal at the first output reflects the reactance of the load imposed on the second output so that the impedance placed on the second output controls the gain between the input and first output of the driver amplifier.

36(new). Apparatus as claimed in claim 33, wherein the automatic gain control comprises a rectifier an integrator and a variable gain device responsive to the integrator.

37(new). Apparatus as claimed in claim 33 , further comprising an output for a second output signal derived from a gain control signal output by the automatic gain control and correlated to the 'Q' of the piezoelectric sensor.

38(new). Apparatus as claimed in claim 33, wherein the drive signal to the piezoelectric sensor is provided by a unity gain buffer .

39(new). Apparatus as claimed in claim 33 , wherein the piezoelectric sensor has two terminals, both of which are actively driven.

40(new). Apparatus as claimed in claim 33, wherein the oscillator circuit includes a NSC Comlinear CLC520 or CLC522 integrated circuit.

41(new). Apparatus as claimed in 1 for measuring a characteristic of a material of interest wherein the

piezoelectric sensor has a structure or compound that interacts with said material of interest attached either to a surface of the sensor or to an electrode on the piezoelectric sensor.

42(new). A method for driving a piezoelectric sensor, the method comprising: providing an oscillating drive signal to the piezoelectric sensor; and controlling the drive signal such that it is maintained at an approximately constant level, the drive signal having a frequency substantially determined by the resonant frequency of the piezoelectric sensor; wherein the drive signal is controlled by generating a current that mirrors the current through the piezoelectric sensor and using said mirror current to create a gain control signal which is used as an automatic gain control feedback signal to maintain said drive signal at an approximately constant level.

43(new). A method as claimed in claim 42 wherein the piezoelectric sensor has two terminals, and said oscillating drive signal is provided by actively driving both terminals of the piezoelectric sensor.

44(new). A method as claimed in either claim 42, wherein the drive signal is provided by a NSC Comlinear CLC520 or CLC522 integrated circuit.

45(new). The use of the apparatus of claim 33 to detect cells or biochemically active compounds, wherein a cell or biochemically active compound is physically coupled to said piezoelectric sensor, and a change in frequency of said output

signal, brought about by the coupling of said cell or biochemically active compound to the piezoelectric sensor, is observed.

46(new). The use of the apparatus of claim 33 to detect an interaction between a cell and a target material, wherein a cell and a target material are physically coupled to said piezoelectric sensor, and a change in frequency of said output signal, brought about by the coupling of said cell and target material to the piezoelectric sensor, is observed.

47(new). The use of the apparatus of claim 33 to perform an immunoassay, wherein a solution containing an antibody and an antigen, or a receptor and a ligand, is physically coupled to said piezoelectric sensor, and a change in frequency of said output signal, brought about by precipitation of an aggregate or clump in said solution, is observed.

48(new). The use of the apparatus of claim 33 to detect a titre of antibody-antigen agglutination, wherein a solution containing an antibody and an antigen is physically coupled to said piezoelectric sensor, and a change in frequency of said output signal, brought about by precipitation of an aggregate or clump in said solution, is observed.

49(new). The use of the apparatus of claim 33 to monitor, in solution, a bacterial characteristic, wherein a solution containing bacteria is physically coupled to said piezoelectric sensor, and a change in frequency of said output

signal, brought about the presence of said bacteria, is observed.

50(new). The use of the apparatus of claim 33 to measure the concentration of bacteria in a solution, wherein a solution containing bacteria is physically coupled to said piezoelectric sensor, and a change in frequency of said output signal, brought about the presence of said bacteria, is measured.

51(new). Analytical apparatus comprising: a piezoelectric sensor; and an oscillator circuit, having passive elements, said oscillator circuit coupled to the piezoelectric sensor and adapted to provide an output signal at an output, wherein the output signal oscillates at the same frequency as the oscillator circuit, said frequency being substantially determined by the piezoelectric sensor, and the oscillator circuit incorporates an automatic gain control feedback loop to maintain a substantially constant drive signal to the piezoelectric sensor, wherein the passive elements of the oscillator circuit are entirely resistive, so that, in use, the oscillator circuit oscillates at a frequency substantially determined by the piezoelectric sensor alone.

52(new). Apparatus as claimed in claim 51, wherein the oscillator circuit includes an amplifier with feedback coupling the output to an input of the amplifier to form a feedback loop through the amplifier, and wherein the feedback loop incorporates an automatic gain control.

53(new). Apparatus as claimed in 51, wherein the automatic gain control comprises a rectifier, an integrator and a variable gain device responsive to the integrator.

54(new). Apparatus as claimed in claim 51, further comprising an output providing a second output signal derived from a gain control signal output by the automatic gain control and correlated to the 'Q' of the piezoelectric sensor.

55(new). Apparatus as claimed in claim 51, wherein the drive signal to the piezoelectric sensor is provided by a unity gain buffer.

56(new). Apparatus as claimed in claim 51, wherein the piezoelectric sensor has two terminals, both of which are actively driven.

57(new). Apparatus as claimed in claim 51, wherein the oscillator circuit includes a NSC Comlinear CLC520 or CLC522 integrated circuit.

58(new). Apparatus as claimed in 51 for measuring a characteristic of a material of interest, wherein the piezoelectric sensor has a structure or compound that interacts with said material of interest attached either to a surface of the sensor or to an electrode on the piezoelectric sensor.

59(new). The use of the apparatus of claim 51 to detect cells or biochemically active compounds, wherein a cell or

biochemically active compound is physically coupled to said piezoelectric sensor, and a change in frequency of said output signal, brought about by the coupling of said cell or biochemically active compound to the piezoelectric sensor, is observed.

60(new). The use of the apparatus of claim 51 to detect an interaction between a cell and a target material, wherein a cell and a target material are physically coupled to said piezoelectric sensor, and a change in frequency of said output signal, brought about by the coupling of said cell and target material to the piezoelectric sensor, is observed.

61(new). The use of the apparatus of claim 51 to perform an immunoassay, wherein a solution containing an antibody and an antigen, or a receptor and a ligand, is physically coupled to said piezoelectric sensor, and a change in frequency of said output signal, brought about by precipitation of an aggregate or clump in said solution, is observed.

62(new). The use of the apparatus of claim 51 to detect a titre of antibody-antigen agglutination, wherein a solution containing an antibody and an antigen is physically coupled to said piezoelectric sensor, and a change in frequency of said output signal, brought about by precipitation of an aggregate or clump in said solution, is observed.

63(new). The use of the apparatus of claim 51 to monitor, in solution, a bacterial characteristic, wherein a solution containing bacteria is physically coupled to said

piezoelectric sensor, and a change in frequency of said output signal, brought about the presence of said bacteria, is observed.

64(new). The use of the apparatus of claim 51 to measure the concentration of bacteria in a solution, wherein a solution containing bacteria is physically coupled to said piezoelectric sensor, and a change in frequency of said output signal, brought about the presence of said bacteria, is measured..

65(new). The use of the apparatus of claim 33 to determine the viscosity and density of a liquid, wherein a said liquid is physically coupled to said piezoelectric sensor, and a change in frequency of said output signal, brought about by the coupling of said liquid to the piezoelectric sensor, and the Q of the sensor are measured.

66(new). The use of the apparatus of claim 33 to determine the binding of a small molecule, wherein a material in which binding of a small molecule takes place is physically coupled to said piezoelectric sensor, and a change in frequency of said output signal, brought about by the binding of said small molecule in said material is observed.

67(new). The use of the apparatus of claim 33 to determine the binding of a ligand, wherein a material in which binding of a ligand takes place is physically coupled to said piezoelectric sensor, and a change in frequency of said output

signal, brought about by the binding of said ligand in said material is observed.

68(new). The use of the apparatus of claim 51 to determine the viscosity and density of a liquid, wherein a said liquid is physically coupled to said piezoelectric sensor, and a change in frequency of said output signal, brought about by the coupling of said liquid to the piezoelectric sensor, and the Q of the sensor are measured.

69(new). The use of the apparatus of claim 51 to determine the binding of a small molecule, wherein a material in which binding of a small molecule takes place is physically coupled to said piezoelectric sensor, and a change in frequency of said output signal, brought about by the binding of said small molecule in said material is observed.

70(new). The use of the apparatus of claim 51 to determine the binding of a ligand, wherein a material in which binding of a ligand takes place is physically coupled to said piezoelectric sensor, and a change in frequency of said output signal, brought about by the binding of said ligand in said material is observed.